10th Class 2021		
Biology	Group-I	Paper-II
Time: 1.45 Hours	(Subjective Type)	Max. Marks: 48

(Part-I)

2. Write short answers to any FIVE (5) questions: (10)

(i) Write two effects of carbon monoxide on our circulatory system.

Ans Carbon monoxide affects our circulatory system in two ways as follows:

1. The carbon monoxide present in tobacco smoke lessens the oxygen-carrying capacity of haemoglobin.
2. It increases the production of blood platelets leading to arteriosclerosis.

(ii) How sound is produced by voice box in human?

Ans The larynx is a box, made of cartilage. It is present between pharynx and trachea. It is also called the voice box. Two pairs of fibrous bands called vocal cords are stretched across the larynx. The vocal cords vibrate when the air passes through them. This vibration produces sounds.

(iii) Define epiglottis.

Ans The glottis is guarded by a flap of tissue called the epiglottis.

(iv) Write two functions of spinal cord.

Ans Spinal cord performs two main functions:

1. It serves as a link between body parts and brain. Spinal cord transmits nerve impulses from body parts to brain and from brain to body parts.

2 Spinal cord also acts as a coordinator, responsible for some simple reflexes.

(v) What is acromegaly?

Ans If somatotrophin (growth hormane) is excessively produced after growing age, internal organs and body extremities alone grow large. This condition is known as acromegaly. Such persons will have large hands, feet and jawbones.

(vi) What are the functions of urinary bladder and urethra in urinary system of human?

Ans The bladder temporarily stores urine until it is released from body. Urethra is the tube that carries urine from urinary bladder to the outside of body.

(vii) What is homeostasis in plants?

Ans Plants respond to environmental changes and keep their internal conditions constant *i.e.,* homeostasis. They apply different mechanisms for the homeostasis of water and other chemicals (oxygen, carbon dioxide, nitrogenous materials, etc).

(viii) How level of calcium ions is regulated in our blood?

Ans Calcitonin and parathormone complement each other and regulate the level of calcium ions in the blood.

---

3. Write short answers to any FIVE (5) questions: (10)

(i) Differentiate between compact bone and spongy bone.

Ans The hardest layer of the bone, on the outside, is called compact bone. The interior of bone is soft and porous. It is called spongy bone. Spongy bone contains blood vessels and bone marrow.

(ii) Define tendons. Write their functions.

Ans Tendons are tough bands and attach muscles to bones. When a muscle contracts tendon exerts a pulling force on the attached bone, which moves as a result.

(iii) What is meant by fragmentation and give an example.

Ans "A type of asexual reproduction in which the animal breaks up into many pieces and each piece develops into a mature animal."

As certain worms grow to full size, they spontaneously break up into 8 or 9 pieces. Each piece (fragment) develops into a mature worm, and the process is repeated. If a planarian breaks into many pieces instead of two, it will also be called as fragmentation.

(iv) Write down two main causes for spread of AIDS.

Ans The main causes of spread of AIDS are as follows:

1. Unprotected sexual activities.
2. Use of infected needles or transfusion of infected blood.

(v) What are nucleosomes?

Ans DNA wraps around histone proteins and forms round structures, called nucleosomes. DNA is also present between nucleosomes. In this way, the nucleosomes and the DNA between them look like "beads on a string".

(vi) Differentiate between transcription and translation.

Ans The specific sequence of DNA nucleotides is copied in the form of messenger RNA (mRNA) nucleotides. This process is called transcription. The mRNA carries the sequence of its nucleotides to ribosome. The ribosome reads this sequence and joins specific amino acids, according to it, to form protein. This step is known as translation.

(vii) Define loci.

Ans The locations or positions of genes on chromosomes are known as loci (Singular: locus).

(viii) What is difference between dominant and recessive allele?

Ans When in the heterozygous condition, one allele masks or prevents the expression of the other, it is called the dominant allele.

The allele which is not expressed is called recessive. The dominant alleles are represented by capital letters and recessive alleles by lower case letters.

---

4. Write short answers to any FIVE (5) questions: (10)

(i) Define ecosystem.

Ans The self-sufficient unit of an environment that is formed as a result of interactions between its biotic community and the abiotic components is known as an ecosystem. A pond, a lake and a forest are examples of natural ecosystems.

(ii) What is biosphere?

Ans All ecosystems of the world together form the biosphere. It includes all the ecosystems of the planet Earth. In other words, the biosphere consists of all organisms present on the Earth and all regions of the Earth where they live.

(iii) What is food web?

Ans A network of food chains which are interconnected at various trophic levels is called as food web.

(iv) Define symbiosis.

Ans **Symbiosis:**

It is a relationship between members of different species, in which they live together for longer or shorter periods of time. Symbiosis is of three types:

(a) Parasitism (b) Mutualism
(c) Commensalism

(v) What is biotechnology?

Ans Biotechnology is defined as "The use of living organisms in processes for the manufacture of useful products or for services."

(vi) Describe the services of Pasteur for fermentation.

Ans In 1857, Pasteur convinced the scientific community that all fermentations are the results of microbial activity. He showed that fermentation is always accompanied by the development of microorganisms. There are many kinds of fermentation and each kind is a characteristics of particular microbial group.

(vii) What is vaccination?

Ans A vaccine is a material containing weakened or killed pathogens and is used to produce immunity to a disease by stimulating the production of antibodies.

The method used to introduce vaccine in the body is called vaccination.

(viii) What is bactericidal antibiotics?

Ans Bactericidal antibiotics are the ones which kill bacteria.

(Part-II)

NOTE: Attempt any TWO (2) questions.

Q.5.(a) Describe the osmoregulatory function of kidney. (4)

Ans For Answer see Paper 2018 (Group-II), Q.5.(a).

(b) What is Cartilage? Explain three types of Cartilage. (5)

Ans **Cartilage:**

Cartilage is a dense, clear blue-white firm connective tissue (but less strong than bone). The cells of cartilage

are called chondrocytes. Each chondrocyte lies in a fluid space caled lacuna present in the matrix of cartilage. The matrix of cartilage contain also collagen fibres. Blood vessels do not enter cartilage. There are three types of cartilage:

(i) **Hyaline cartilage** is strong yet flexible. It is found covering the ends of the long bones, in the nose, larynx, trachea and bronchial tubes.

(ii) **Elastic cartilage** is similar in structure to hyaline cartilage. It is also quite strong but has elasticity due to a network of elastic fibres in addition to coliagen fibres. It is found in epiglottis, pinna, etc.

(iii) **Fibrous cartilage** is very tough and less flexible due to large number of thick collagen fibres present in knitted form. It is found in intervertebral discs.

Q.6.(a) Define feedback mechanism. Also explain negative feedback and positive feedback. (4)

Ans **Feedback Mechanism:**

Endocrine glands do not secrete their hormones at a constant rate. The rate varies with the needs of the body. Like many other functions in body, the secretion of hormones is also regulated by feedback mechanisms. Feedback mechanism means the regulation of a process by the output of the same process. Feedback mechanisms are of two types *i.e.*, positive and negative feedbacks.

In negative feedback, the output of a process decreases or inhibits the process. This mechanism works to return a condition towards its normal value. For example, when the blood glucose concentration rises, pancreas secretes insulin. It decreases the blood glucose concentration. Decline in the blood glucose concentration to a normal set-point inhibits the secretion of insulin. Similarly, When blood glucose concentration drops below normal, pancreas secretes glucagon. It raises the blood glucose concentration in the blood glucose concentration

to a normal set-point inhibits the secretion of glucagon. In other words, the blood glucose concentration (output) controls the process *i.e.*, the secretion of insulin and glucagon.

In positive feedback, the changes resulting from a process increase the rate of process. For example, suckling action of an infant stimulates the production of a hormone in mother. This hormone works for the production of milk. More suckling leads to more hormone, which in turn leads to more milk production.

(b) Compare adaptations in insect-pollinated and wind-pollinated flowers. (5)

Ans

Adaptations in insect-pollinated and wind-pollinated flowers		
Feature	**Insect-Pollinated Flowers**	**Wind-Pollinated Flowers**
Size	Generally large	Generally small
Colour	Petals brightly coloured	Petals green or dull in colour
Nectar	Produce nectar	Do not produce nectar
Floral arrangement	Flowers face upwards	Flowers hang down for easy shaking
Stamens and stigmas	Enclosed inside ring of petals	Hang out of ring of petals
Pollen grains	Small number produced / heavy and sticky	Large number produced / light with smooth surface
Stigma	Pinhead shaped with no branches	Feathery branches for catching pollen

Q.7.(a) Write a note on medicinal drugs. (4)

Ans **Medicinal Drugs:**

Various diseases have been made easier to treat in recent years by the production of medicinal drugs. Drugs are obtained from the following sources:

1. Synthetic Drugs:

Such drugs do not occur naturally but are synthesized in laboratory. Pharmaceutical companies produce these drugs *e.g.*, aspirin.

Drugs from Plants and Fungi:

Many important medicines are obtained from plants and fungi. These medicines include antibiotics, cardiotonics and certain analgesics. The antibiotic penicillin comes from a fungus. The cardiotonic, known as digitalis, is used to stimulate the heart. It is made from the leaves of purple flowered plant, foxglove.

The pain relieve morphine is made from opium, which comes from the juice of opium poppy plant.

3. Drugs from Animals:

Drugs obtained from animals are usually their glandular products. Fish liver oils, musk, bees' wax, certain hormones and antitoxins are obtained from animal sources.

4. Drugs from Minerals:

Several common drugs are produced from minerals. The mineral iodine is used in making tincture of iodine, a liquid that helps prevent infection when applied to cuts and bruises. The powder form of silver nitrate is applied on wounds to stop bleeding and prevent infection.

5. Drugs from Bacteria:

Many antibiotics *e.g.*, streptomycin are obtained from bacteria.

(b) Write a note on applications of fermentation. (5)

Ans Applications of Fermentation:

In fermentation, maximum growth of an organism are obtained for the production of desired products of commercial value. Traditionally, only food and beverage products were produced by using fermentation. Now many other products *e.g.*, industrial chemicals are also being produced.

(a) Fermented Foods:

Fermentation often makes the food more nutritious, more digestible and tastier. It also tends to preserve the

food, lowering the need for refrigeration. The following groups are included in the fermented foods:

Cereal products:

Bread is the commonest type of fermented cereal product. Wheat dough is fermented by S. cerevisiae along with some lactic acid bacteria.

Dairy products:

Cheese and yogurt are important fermentation products. Cheese is formed when a milk protein is coagulated. This happens when the acid produced by lactic acid bacteria reacts with milk protein. Yogurt is made from milk by different lactic acid bacteria.

Fruit and vegetable products:

Fermentation is usually used, along with salt and acid, to preserve pickle, fruits and vegetables.

Beverage Products:

Beer is produced from cereal grains which have been malted, dried and ground into fine powder. Fermentation of the powder is done by yeast. This process breaks the glucose present in powder into pyruvic acid and then into ethanol. Grapes can be directly fermented by yeasts to wine.

(b) Industrial Products:

The following are the important industrial products produced through the process of fermentation.